Precalc Warm Up # 1-5

Solve for x:

1. $\left|\frac{5x}{3}+\frac{1}{4}\right|=\frac{5}{6}$

2. $\frac{3+ax}{b}+\frac{1-x}{a}=0$

3. $\frac{3(x+1)}{5}-2=\frac{x+2}{10}$

4. $\frac{3-2x}{7}\le\frac{4x-3}{-2}$

3. $10\left(\frac{3(x+1)}{5}-2\right)=\frac{x+2}{10}\cdot 10$

$x=\frac{16}{5}$

4. $-14\left(\frac{3-2x}{7}\right)\le\frac{4x-3}{-2}(-14)$

$-2(3-2x)\ge 7(4x-3)$

$x\le\frac{5}{8}$

Questions on #1-4?
p. 25

EXERCISES 2.2.1

1. Solve the following linear equations.

(d) $\frac{3-2x}{7} = 2$ (e) $\frac{5x}{3} + \frac{1}{2} = \frac{2}{3}$

2. Solve the following equations.

(b) $3\left(2 - \frac{1}{2}x\right) = 4$

(e) $3\left(5 - \frac{1}{3}x\right) = x - 20$

3. Solve the following equations.

(b) $\frac{u-1}{4} - 3 = \frac{u}{3}$

(e) $(y-1)\left(\frac{1}{y-1} + 1\right) = \left(\frac{2}{y-1}\right)(y-1)$ $y \neq 1$

$1 + y - 1 = 2$

4. Solve the following equations for x

(b) $\frac{\cancel{a}(x-b)}{\cancel{a}} = \frac{b+a}{a}$; $a \neq 0$ $x - b = \frac{b}{a} + 1$

$\boxed{\begin{matrix} a \neq 0 \\ b \neq 0 \end{matrix}}$ (e) $ab\left(\frac{x}{b} - a\right) = \left(\frac{x}{a} - b\right)ab \longrightarrow ax - a^2b = bx - ab^2$

(h) $\frac{1-ax}{b} + \frac{1-bx}{a} = 0$

$ax - bx = a^2b - ab^2$

$\frac{x(a-b)}{a-b} = \frac{ab(a-b)}{a-b}$

$\boxed{x = ab;\ a \neq b}$

See next page

4. Solve the following equations for x

(b) $a(x-b) = b + a$

(e) $\frac{x}{b} - a = \frac{x}{a} - b$

(h) $ab\left(\frac{1-ax}{b} + \frac{1-bx}{a}\right) = 0(ab)$

$a \neq 0$

$b \neq 0$

$a - a^2x + b - b^2x = 0$

$a + b = a^2x + b^2x$

$\frac{a+b}{a^2+b^2} = \frac{x(a^2+b^2)}{a^2+b^2}$

$x = \frac{a+b}{a^2+b^2}$

5. Solve for x.

(b) $|5x - 3| = 12$

(e) $\left|\frac{5x}{3} + \frac{1}{2}\right| = \frac{2}{3}$

(h) $\left|3\left(2 - \frac{1}{2}x\right)\right| = 4$

(k) $a - \left|\frac{1}{b}x\right| = b$

$-\left|\frac{1}{b}x\right| = b - a$

$\left|\frac{1}{b}x\right| = a - b$

$\frac{1}{b}x = a - b$

$\boxed{x = ab - b^2}$

$\frac{1}{b}x = -(a-b)$

$b \cdot \frac{x}{b} = (b-a)b$

$\boxed{x = b^2 - ab}$

$\text{pos \#} = \text{pos \#} \rightarrow a \geq b$

EXERCISES 2.2.2 p. 28

1. Solve the following inequalities.

(b) $3 \cdot \frac{x-4}{3} \geq (2x-1)3$

(e) $\frac{x-4}{5} > \frac{2-x}{2}$

$x - 4 \geq 6x - 3$

2.(b) $4\left(\frac{1+x}{2} + \frac{1-x}{4}\right) \leq 4$

$2 + 2x + 1 - x \leq 4$

$x + 3 \leq 4$

$x \leq 1$

3. Solve the following inequalities.

(a) $a(x+1) > 2a$, $a < 0$ means: "a" is negative.

$\frac{a(x+1)}{a} > \frac{2a}{a}$

$x + 1 < 2$

$x < 1$

(b) $\frac{a-x}{2} + 1 > a$, $a > 0$

"a" is positive.

first step times 2

Yesterday, Solving Linear and Absolute Value Equations:

Ex: $2(x + 3) - 9 = 2x$ and $|x-2|=17$

$2x + 6 - 9 = 2x$

$-3 \neq 0$

No Sol.

$x - 2 = -17$ or $x - 2 = 17$

$x = 19, -15$

Solve by clearing fractions using the LCD: $= 120$

LCD

$2 \cdot 5 \cdot 4 \cdot 3$ $\quad 120\left(\frac{7}{10}(x-3) + \frac{5x}{8}\right) = \left(3x + \frac{2}{3}\right)120$

$x = -\frac{332}{201}$

Using a grapher to solve:

solve(0.7(x−3) + 5x/8 − 3x − 2/3, x, guess

This one is tricky!

$|x| = 2x + 1$

If you use your previous rules:

$x = 2x + 1$ or $x = -(2x+1)$

$x = -1$ $\quad x = -\frac{1}{3}$

But one of these is extraneous!

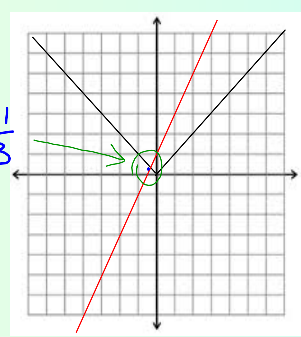
Would it have been a good idea to solve with your grapher?

Solve(2x+1 − abs(x), x, guess).

$x = -\frac{1}{3}$

OR Graph & find intersection.

$x = -\frac{1}{3}$

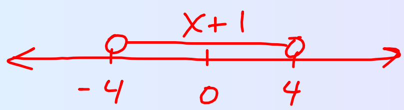


Absolute Value Inequalities:

Rewrite it as a compound inequality in order

to drop the absolute value. Think about the meaning!

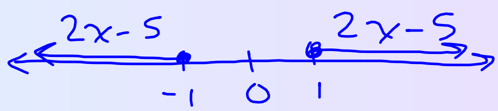
ex: Solve for x $\{x : |x + 1| < 4\}$



$-4 < x + 1 < 4$

$\boxed{-5 < x < 3}$

ex: $\{x : | 2x - 5 | \geq 1\}$



$2x - 5 \leq -1$ or $2x - 5 \geq 1$

$\boxed{x \leq 2 \quad \text{or} \quad x \geq 3}$

$|x| < a$ means x is less than a units from zero

pos# $< a$

$a > 0$

$|x| > a$ means x is more than a units away from zero

But be careful of rule memorizing! If you don't understand the rule, you may solve incorrectly:

$|x + 3| > -2$

$x = \mathbb{R}$

$|4x-9| \leq -7$

No Sol.

If you are forced to multiply or divide by a negative number, change the direction of the inequality sign...

If you are multiplying or dividing by an expression, you need to know if the expression is positive or negative!

HW: SL book

p. 25 # 4-5 RC and

p. 28 #1-2 RC, 3cd, 4-5 RC, 6

1st HW Quiz next Tuesday

1st Skills Quiz next Thursday